

→

ATTORNEY DOCKET NO.
091078.0554

→

PATENT APPLICATION
Serial No. 09/074,496

3

an elongated body having an upper portion and a lower portion;

a rotatable coupling assembly disposed between the upper portion and the lower portion of the elongated body;

the upper portion of the elongated body having a first end;

the lower portion of the elongated body having a second end which may be inserted into the soil adjacent to a roadway;

means for attaching the guardrail adjacent to the first end of the upper portion; and

I₂
(undlt)
means for releasably securing the upper portion of the elongated body in a generally collinear alignment with the lower portion of the elongated body such that an impact with one end of the attached guardrail will tend to rotate the upper portion of the elongated body relative to the lower portion of the elongated body and the breakaway support post will resist a rail face impact with the guardrail.

6. The breakaway support post of Claim 5 wherein the rotatable coupling further comprises:

a first U-shaped bracket and a second U-shaped bracket with portions of the first bracket disposed within the second bracket; and

a pivot pin extending laterally through adjacent portions of the first bracket and the second bracket whereby the upper portion of the elongated body may rotate relative to the lower portion of the elongated body.

I₃
7. The breakaway support post of Claim 5 wherein the upper portion of the elongated body and the lower portion of the elongated body further comprise:

DAL01:732879.1

ATTORNEY DOCKET NO.
091078.0554

PATENT APPLICATION
Serial No. 09/074,496

4

a metal I-beam having a web with a pair of flanges attached thereto;

a respective bracket attached to adjacent ends of the upper portion and the lower portion; and

*I,
(undl)* a pivot pin extending through the brackets and aligned approximately parallel with the web of the upper portion whereby the breakaway support post will resist a rail face impact with the guardrail.

I, 8. The breakaway support post of Claim 5 further comprising a block affixed to the upper portion of the elongated body and adapted for mounting the guardrail to form a lateral offset between the guardrail and the breakaway support post.

9. A breakaway support post for mounting a guardrail thereon as part of a highway guardrail system comprising:

an elongated body having an upper portion and a lower portion;

the upper portion of the elongated body having a first end;

the lower portion of the elongated body having a second end;

means for attaching the guardrail adjacent to the upper portion; and

I, means for coupling the first end of the elongated body with the second end of the elongated body such that an impact with one end of the attached guardrail will tend to rotate the upper portion of the elongated body relative to the lower portion of the elongated body and the breakaway support post will resist a rail face impact with the guardrail.

DAL01:732879.1

ATTORNEY DOCKET NO.
091078.0554

PATENT APPLICATION
Serial No. 09/074,496

5

I₆
10. The breakaway support post of Claim 9 wherein the means for coupling the first end with the second end comprises first and second breaker bars.

11. The breakaway support post of Claim 10 wherein the first and second breaker bars are formed with respective chambered surfaces to facilitate rotation of the upper portion relative to the lower portion and to facilitate separation of the upper portion of the elongated body from the lower portion of the elongated body.

I₇
12. The breakaway support post of Claim 10 wherein the first and second breaker bars further comprising protruding members to facilitate rotation of the upper portion relative to the lower portion and to facilitate separation of the upper portion of the elongated body from the lower portion of the elongated body.

I₈
24. A roadway guardrail system comprising:
a guardrail;
at least one support post having an upper portion and a lower portion, the upper portion having a lower end and the lower portion having an upper end;
the upper portion being coupled to the guardrail and the lower portion being insertable into the earth;
the upper portion lower end being pivotally coupled to the lower portion by a hinge, the hinge having a pivot pin that extends in a strong direction which is substantially perpendicular to the guardrail, wherein the post exhibits a high mechanical strength in the strong direction, the hinge having a weak direction that is generally perpendicular to the strong direction, wherein the upper portion can rotate

DAL01:732879.1

→

ATTORNEY DOCKET NO.
091078.0554

→

PATENT APPLICATION
Serial No. 09/074,496

6

relative to the lower direction from an impact in the weak direction; and

the hinge is releasably restrained from pivoting by a shear pin, the shear pin being smaller in diameter than the pivot pin.

I₇
(cont.)

25. The roadway guardrail system of Claim 24 wherein the upper and lower portions each comprise an I-beam having a web and flanges, the webs of the I-beams being oriented generally perpendicular to the guardrail.

26. The roadway guardrail system of Claim 24 wherein the hinge comprises:

a first U-shaped bracket and a second U-shaped bracket with portions of the first bracket being disposed within the second bracket; and

the pivot pin extending laterally through the first bracket and through adjacent portions of the first bracket and the second bracket whereby the upper portion of the post can rotate relative to the lower portion of the post.

I₉

27. The roadway guardrail system of Claim 24 wherein the hinge has a first bracket coupled to the upper portion and a second bracket coupled to the lower portion, the first bracket receiving the pivot pin by a slot, the slot being oriented so that when the upper portion is rotated relative to the lower portion, the upper portion can separate from the lower portion.

32. A support post for mounting a guardrail thereon as part of a highway guardrail system, comprising:

I₁₀

DAL01:732879.1

→

ATTORNEY DOCKET NO.
091078.0554

→

PATENT APPLICATION
Serial No. 09/074,496

7

a first elongated member having first and second ends, with the first end of the first member adapted to receive a guardrail;

a second elongated member having first and second ends, with the first end of the second member being insertable into the ground adjacent to a roadway;

one of the second ends having a first bracket with a generally U-shaped configuration extending therefrom;

the other of the second ends having a second bracket extending therefrom;

the second bracket being received in the first U-shaped bracket;

In (un-4)
the first and second brackets being coupled together by a pin extending along an axis substantially perpendicular to a received guardrail, wherein the first and second members are rotatably coupled; and

the first and second members being maintained in a first position by a shearable body extending between the second bracket and at least a portion of the first U-shaped bracket.

33. A support post for mounting to a guardrail as part of a highway guardrail system, comprising:

a first I-beam having first and second ends, with the first end of the first I-beam being structured and arranged to couple to the guardrail;

a second I-beam having first and second ends, with the first end of the second I-beam being insertable into the ground adjacent to a roadway;

In
each of the first and second I-beams having a web and flanges, with the flanges at the respective second ends having extensions protruding beyond the web;

DAL01:732879.1

→

ATTORNEY DOCKET NO.
091078.0554

→

PATENT APPLICATION
Serial No. 09/074,496

8

the extensions of the first I-beam being located adjacent to the extensions of the second I-beam, the extensions of the first and second I-beams being pivotally coupled together by a hinge pin so that the first and second I-beams pivot about an axis that is parallel to the web of the first I-beam between a lengthened, substantially collinear position and a non-collinear position; and

3" (1.111)
the first and second I-beams being maintained in the lengthened position by a shearable member extending between at least one of the extensions of the first I-beam and at least one of the extensions of the second I-beam.

36. A roadway guardrail system, comprising:

a guardrail;

at least one support post having an upper portion and a lower portion, the upper portion having a lower end and the lower portion having an upper end;

the upper portion being coupled to the guardrail and the lower portion being insertable into the earth;

I₁₂
the lower end of the upper portion being coupled at the upper end to the lower portion by a rotatable coupling that rotates about an axis when the post is impacted in a direction that is generally parallel to the guardrail, the axis being substantially perpendicular to the guardrail, the post exhibiting a high mechanical strength in the direction of the axis; and

the rotatable coupling having a frangible connection for maintaining the upper portion in an upright alignment with respect to the lower portion.

37. A breakaway guardrail post for highway crash control systems comprising:

I₁₃
DAL01:732879.1

→

ATTORNEY DOCKET NO.
091078.0554

→

PATENT APPLICATION
Serial No. 09/074,496

9

an upper post member having a weak impact axis and a strong impact axis;

a lower post member disposed beneath and spaced apart from said upper post member;

a connecting joint member having a first end and a second end, said first end of said joint member connected at said first end by a first fastener to said upper post member and connected at said second end by an attachment to said lower post member, said first fastener having a first failure strength less than a second failure strength of said attachment;

*I₁
(un-ld)*

said first fastener having a first connector having a first failure strength and a second connector having a second failure strength; and

said first failure strength greater than said second failure strength such that upon an impact force being applied along said weak impact axis, said second connector fails and said upper post member rotates about said first connector.

39. A roadway guardrail system comprising:

a guardrail;

at least one support post coupled to said guardrail and comprising an elongate body having a first portion and a second portion arranged in a substantially colinear relationship;

I₁₄

a frangible connection for coupling the first portion with the second portion, the frangible connection including a rotatable coupling assembly disposed between the first portion and the second portion of the elongate body; and

the frangible connection oriented relative to the guardrail such that an impact with one end of the guardrail coupled the support post will tend to buckle the support post

DAL01:732879.1

→

ATTORNEY DOCKET NO.
091078.0554

→

PATENT APPLICATION
Serial No. 09/074,496

10

and such that the support post will resist an impact with a railface of the guardrail.

*I₁₄
(condi)*

40. (New) A breakaway guardrail post for highway crash control systems comprising:

an upper post member having a weak impact axis and a strong impact axis;

a lower post member disposed beneath and spaced apart from said upper post member;

a connecting joint member having a first end and a second end, said first end of said joint member connected at said first end by a first fastener to said upper post member and connected at said second end by a second fastener to said lower post member, said first fastener having a first failure strength less than a second failure strength of said second fastener;

said first fastener having a first connector having a first failure strength and a second connector having a second failure strength; and

said first failure strength greater than said second failure strength such that upon an impact force being applied along said weak impact axis, said second connector fails and said upper post member rotates about said first connector.

I₁₅

REMARKS

Claim 40 has been added. Claims 5-12, 24-27, 32-33, 36-37 and 39-40 are present in the application. Reconsideration of the application, is respectfully requested.

DAL01:732879.1